Space Weather Forecast

Issued on Saturday, 07 October 2023 at 01:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity is Low, with only minor Common-class flares observed in the last 24 hours. There are now nine sunspot regions on the visible disc. The two largest regions are in the north-centre disc, both with some magnetic complexity, but more so in the northern of the two regions. A small region near south centre disc, whilst having very small spots, has a somewhat complex magnetic configuration. The remaining regions all appear to be small and mostly simple at present.

Whilst there have been a couple of Coronal Mass Ejections (CMEs) assessed from the Sun in the last 24 hours, neither are expected to give significant impacts at Earth. A recent eruption and small flare from the region near south centre disc may have launched a CME towards Earth, but we await imagery for assessment.

Solar Wind / Geomagnetic Activity: Solar winds showed a weak CME arrival around 05/2140 UTC. Wind speeds have been slightly elevated varying between 420-490 km/s. Total magnetic field strength has been mostly weak, but with brief moderate peaks after the CME arrived. The north-south component varied weakly. Geomagnetic activity has been Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Mainly Low with a chance of Moderate flare activity, mainly from the two larger regions near north centre disc.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 02 Oct arrived at Earth at 05/2140 UTC. Wind speeds are currently slightly elevated, and are expected to decline towards background levels by Day 2 (07 Oct). A coronal hole fast wind may arrive at Earth later on Day 4, with wind speeds perhaps reaching elevated levels.

Mostly Quiet to Unsettled geomagnetic activity is expected, with a slight chance of Active intervals on Day 1 (06 Oct) due to tailing CME effects. There is chance of Active intervals on Day 4 mainly due to possible fast wind effects.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, with a very low risk of enhancements from the current sunspots on the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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